

4. ENVIRONMENTAL CONSEQUENCES

This section describes the environmental consequences associated with the proposed action and alternatives. Potential environmental impacts were analyzed for each of the primary media pathways (e.g., air, geology and soils, water resources, ecological resources). Additional analysis of impacts to the environment may be found in the Quadrant II CAS/CMS [Sections 6.6, 6.7, 7.5, and 7.6] and an addendum to the Quadrant II CAS/CMS [Chapter 2].

4.1 LAND AND FACILITY USE

4.1.1 Proposed Action

Under the proposed action, the general use of the land in Quadrant II would remain unchanged. The land that may be impacted by the corrective measures activities is currently being used for industrial activities focused on environmental remediation. The proposed action may change the nature of some of the existing remediation activities and add new corrective measures but will not change the type of activities for which the land is currently being used. Some buildings and storage yards may need to be removed, relocated, and/or rebuilt where there are interferences with proposed corrective measures implementation actions.

4.1.2 No Action

Under the no action alternative for Quadrant II, the existing remediation activities would continue at their present levels. There would be no impact on land or facility use from present uses.

4.2 AIR QUALITY

4.2.1 Proposed Action

Local air quality should be minimally affected by emissions from vehicle and equipment exhaust, fugitive dust from vehicle traffic, and disturbance of soils during construction. These emissions would include carbon monoxide, nitrogen dioxide, sulfur dioxide, PM-10 (inhalable particulate matter with particles less than 10 microns in diameter), and hydrocarbons. The level of permitted emissions would be documented in Ohio EPA construction/operation permits that must be obtained prior to construction activities. Particulate matter emissions would primarily consist of airborne soil. Site preparation and construction emissions would be short term, sporadic, and localized (except for emissions from vehicles of construction workers and of transport of construction materials and equipment). Dispersion would decrease concentrations of pollutants in the ambient air as distance from the construction site increased. Increments of pollutants due to workers' vehicles and construction vehicles and equipment would not be expected to cause any exceedances of primary or secondary NAAQS (Table 3.1).

Small increases in PM-10 concentrations (inhalable particulate matter with particles less than 10 microns in diameter) due to fugitive dust from excavation and earthwork probably would be noticeable on-site during construction of the cap corrective measure option and during soil excavation. Emissions would be localized at the X-701B site and off-site impacts to ambient air quality would not be expected. Control measures for lowering fugitive dust emissions (i.e., covers and water or chemical dust suppressants) would minimize local emissions.

Installation of corrective measures such as oxidant injection wells, planting of trees for phytoremediation, installation on VER and/or steam stripping equipment could cause a small temporary reduction in local ambient air quality as a result of fugitive dust and emissions generated by construction equipment. Off-gas treatment systems may be required for the VER/Steam Stripping corrective measures but emissions from the treatment systems should be minimal. The demolition/replacement of the existing facilities could also have a minor temporary effect. The extent of dust generation would depend on the level of construction activity and on soil composition and dryness, and the degree of dust suppression techniques employed. The emissions from construction vehicles and equipment would not be expected to have an impact on the overall air quality of the region.

4.2.2 No Action

No additional air emissions would result from the Quadrant II no action alternative. Airborne emissions from ongoing uranium enrichment operations were reduced in May 2001 as a result of placing the enrichment cascade in cold standby. Emissions from Transfer and Shipping activities are expected to continue until June 2002. Ongoing environmental restoration and D&D activities would be expected to continue as well. Air quality effects from ongoing operations and remedial actions in Quadrant II are relatively small, and the radiological dose via the air pathway is well below applicable limits.

4.3 GEOLOGY AND SOILS

4.3.1 Proposed Action

Because all activities would take place in areas encompassing PORTS industrial activities, no existing or potential farmland protected under The Farmland Protection Policy Act would be impacted.

Significant amounts of excavation and soil contouring could occur under the proposed action at the X-701B Holding Pond and Retention Basins area. Site clearing, grading, and contouring for a cap could alter the topography of the land around the X-701B Holding Pond and Retention Basins but should not effect the underlying geological formations. In addition, removal of contaminated soil and capping of the remaining contaminated area would be considered a beneficial impact.

Minor excavation would be required in previously disturbed areas in order to install groundwater treatment systems. Impacts to geology and soils would be negligible.

4.3.2 No Action

No impact to the geology of Quadrant II is expected to occur under the no action alternative.

4.4 WATER RESOURCES

4.4.1 Proposed Action

For the alternatives evaluated, uncontrolled soil erosion would increase sedimentation and turbidity in the receiving surface waters. Spills of fuel, hazardous material, waste, or a sewer line leak could have adverse impacts on surface waters if not controlled or contained. Impacts would primarily be a change to the water quality (pH, dissolved oxygen, conductivity, etc.), which could affect vegetation and aquatic biota. Soil erosion impacts would be mitigated through the use of best management practices (BMPs) (i.e., silt fences, straw bales, and temporary sediment detention basins). The potential for spills would be

mitigated through the adherence to proper safety procedures and spill prevention plans. In the event of a spill from an accident, spill response measures (e.g., booms, berms, sorbents, neutralizers, secondary containment, and mechanical removal equipment) would minimize potential adverse impacts.

Coordination with DOE and their site management contractor's Environment, Safety, and Health organization also would be required prior to any earth-disturbing activities, changes in discharges to the storm drain system, outdoor application of herbicides and pesticides, or facility modifications.

Impacts to groundwater quality could also occur as a result of a fuel, waste spill, or a sewer line leak and subsequent migration of contaminants through the soil profile to the groundwater table. A spill directly into the surface water bodies in the vicinity also could affect the groundwater quality because of the connection between surface water and groundwater resources. The use of safety procedures, spill prevention plans, and spill response plans in accordance with state and federal laws would minimize the severity of potential impacts from accidents.

The small potential impact to surface waters would originate from soil erosion, runoff, and sedimentation during excavation and capping activities, well installation, or modification of groundwater treatment facilities. In addition, a fuel, hazardous material, waste spill or leak could occur during construction activities and operation of new groundwater treatment facilities. As mentioned previously, soil erosion impacts would be mitigated through the use of BMPs (i.e., silt fences, straw bales, and temporary sediment detention basins). The potential for spills would be mitigated through the adherence to proper safety procedures and spill prevention plans. Additional discussion of these potential impacts can be found in the Quadrant II CAS/CMS [Chapters 6 and 7] and the Addendum to Quadrant II CAS/CMS [Chapter 2].

4.4.2 No Action

Under the Quadrant II no action alternative, the site could expect continued impacts to surface water and groundwater. Although monitoring and appropriate environmental restoration measures would be continued and appropriate mitigation measures would remain in place, releases could occur. Impacts to surface water or groundwater could also occur as the result of a spill or leak from ongoing operations. Surface and groundwater protection measures, such as spill prevention and spill response plans, are already in place at PORTS for ongoing operations.

4.5 FLOODPLAINS AND WETLANDS

4.5.1 Proposed Action

The construction activities at the X-701B Holding Pond and Retention Basins and the X-701B groundwater plume associated with the range of possible corrective measures may impact wetlands adjacent to these units and area streams. However, these potential impacts would be indirect and in the form of potential accidental releases that could result in contamination of wetlands and area streams. As currently envisioned, the proposed corrective measures are designed to preclude any direct impact on adjacent wetlands. Control measures such as silt fences, erosion control, and dust prevention as well as other possible engineered controls would be utilized to prevent any indirect impacts. Neither adverse nor beneficial influences on flood elevations will occur because Quadrant II is not located in a 100- or 500-year floodplain.

4.5.2 No Action

Under the Quadrant II no action alternative, the PORTS site could expect impacts to surface water and groundwater. Consequently, impacts to floodplains and wetlands could result from transport of contaminants through surface water and groundwater to these sensitive areas. Although monitoring and appropriate environmental restoration measures would be continued as long as operational activities are taking place, eventual abandonment of the Quadrant II contaminated areas without restriction could possibly result in the spread of contamination to floodplains and wetlands in and surrounding the site.

4.6 ECOLOGICAL RESOURCES

4.6.1 Proposed Action

Activities associated with the proposed action would have no direct impact on terrestrial habitats, plants, and animals present within PORTS. Since there are no construction activities associated with this alternative outside of previously disturbed areas, no adverse impacts to terrestrial and aquatic ecosystems would be expected. If impacts to ecological resources at PORTS are encountered, they would be addressed by avoiding the resource, minimizing the impact, or mitigating the impact if avoidance or minimization is not possible.

No direct or indirect impacts would occur to any threatened and endangered species from completion of the proposed action. No federally listed threatened and endangered plants or animals are known to exist within the boundary of PORTS. Carolina yellow-eyed grass (state-listed endangered) and Virginia meadow-beauty (state-listed potentially threatened) occur within Quadrant IV, but these areas would not be affected by this alternative. The USFWS has indicated that the Indiana bat is the only federally listed endangered animal species whose home range includes PORTS, although no Indiana bats have ever been captured or observed at the site. The USFWS has recommended that if potential roost trees with exfoliating bark are encountered in any area proposed for development, they and surrounding trees should be saved wherever possible. If such trees are within the area and they require removal, they should not be cut between April 15 and September 15. If potential maternity roost trees are present, and if the above time restriction is unacceptable, mist net or other surveys should be conducted to determine if Indiana bats are present. If needed, the surveys should be conducted in June or July to coincide with the peak summer bat population. If direct impacts to potential Indiana bat habitat could not be avoided, DOE would implement the USFWS recommendations.

The proposed action for conducting corrective measures activities in Quadrant II at PORTS would lie within the range of the habitat for the timber rattlesnake, a large shy rattlesnake that is declining throughout its national range. No Federal listing status has been assigned to this species; however, the USFWS has initiated a pre-listing Conservation Action Plan to support state and local conservation efforts. The timber rattlesnake is protected throughout much of its range and listed as endangered by the State of Ohio. Proactive efforts to conserve this species would be taken to avoid potential impacts to the timber rattlesnake and their habitat including protection of winter dens which is critical to the survival of this species. Although the distribution of the timber rattlesnake species includes PORTS, there have been no sightings at the site. Procurement documents for corrective measures construction activities would contain provisions for the protection of sensitive wildlife populations if encountered including Indiana bats and timber rattlesnakes.

4.6.2 No Action

The potential exists for a spill or leak from normal ongoing operations and traffic at Quadrant II. Impacts to biota could include direct mortality, injury, and degradation of the impacted habitat. Because of the limited habitat and biota at the site, these impacts would probably be minor to moderate and the resource would be expected to recover within a few months to a year depending on the severity of the spill or leak. Without completing the recommended corrective actions at Quadrant II, the potential for migration of contamination currently present at controlled areas of the plant will be greater if current controls are not maintained following cessation of ongoing operations. This migration would have the potential for impacting biota on and nearby the site due to increased long-term exposure to contaminants.

4.7 CULTURAL RESOURCES

4.7.1 Proposed Action

Notifications of the proposed actions have been provided to Ohio SHPO (a copy of the notification letter and response are included in Appendix A). In previous discussions with the Ohio SHPO, the preservation office has stated that PORTS is considered eligible for inclusion in the NRHP because of its exceptional significance in the history of post-World War II United States and, in particular, in our development on nuclear energy potential. DOE PORTS provided a determination that there would be an adverse effect on four of the facilities at PORTS as a result of the proposed action. Because the facilities involved are not considered contributing resources, however, negligible, if any, effects on the historical integrity of the PORTS core plant are anticipated. In addition to the NHPA, cultural resources on federal lands are also protected under the Archaeological Resources Protection Act of 1979, as amended, and the Native American Graves Protection and Repatriation Act of 1990. If an unanticipated discovery of cultural materials (e.g., human remains, pottery, bottles, weapon projectiles, and tools) or sites was made during development activities, all ground-disturbing activities in the vicinity of the discovery would be halted immediately. The DOE-Oak Ridge Operations (ORO) Cultural Resources Management Coordinator would be contacted, and consultation with the Ohio SHPO would be initiated and completed prior to any further disturbance of the discovery-site area.

One existing facility in Quadrant II may be directly effected by one of the proposed corrective measures alternatives at the X-701B Holding Pond and Retention Basins and would have to be removed if that corrective measure is chosen and implemented. This facility is the X-701E Neutralization Building. The X-701E facility was built around 1973 as a pumphouse/treatment facility near the influent to the X-701B Holding Pond. The 18 ft by 22 ft building is made of steel frame with aluminum panels and is built on a concrete pad. The building and the treatment pond it supported were deactivated in 1988. The building has been used periodically since 1990 as a treatment facility for groundwater in the area of the X-701B Holding Pond. Because of its recent construction, the fact that it is not unique in terms of history, architecture or engineering, and the fact that it adds little to the understanding of the facility, the demolition of this facility will have no effect on the structures and the qualities that give significance to this historic property. A file will be maintained including mapping and photographs showing the setting of this facility before and after the construction.

One existing facility in Quadrant II would be directly impacted by several of the proposed corrective measures for the X-701B groundwater plume and would have to be removed if any of those corrective measures are chosen and implemented. This facility is the X-747G Precious Metal Scrap Yard. The X-747G Precious Metal Scrap Yard was constructed in 1976. This 25,000 ft² outdoor storage area is surrounded by an 8 ft, chain link, wire fence and is used for the storage of contaminated cascade scrap metal parts made of valuable alloys. Because of its recent construction, the fact that it is not unique in

terms of history, architecture or engineering, and the fact that it adds little to the understanding of the facility, the demolition of this facility will have no effect on the structures and the qualities that give significance to this historic property. A file will be maintained including mapping and photographs showing the setting of this facility before and after the construction.

Two temporary treatment and support facilities in Quadrant II have reached the end of their operational life and may be replaced under certain corrective measures scenarios described in the proposed action. These are the X-622T Groundwater Treatment Facility and the X-624 Groundwater Treatment Facility. These replacement facilities will be necessary to continue to support the control and remediation of the Quadrant II groundwater plumes. The X-622T unit is a trailer-mounted unit built in the early 1990s to treat groundwater pumped from the building sumps in the X-705 Decontamination Building and X-700 Cleaning Building. Other groundwater generated from non-routine activities around the plant were also occasionally treated at this unit. The X-624 unit was constructed in the 1993-1995 timeframe to treat primarily groundwater collected from an interceptor trench running across the east side of the X-701B Groundwater Plume. All of these buildings are pre-fabricated steel-frame type buildings build on concrete pads. These buildings will be torn down to the concrete pad and new units constructed near the current sites to support new treatment processes. The X-622T replacement unit will be built near the current location. The replacement for the X-624 unit would also be constructed near the site of its current location. As with the X-701E building and the X-747G Storage Yard, the demolition of these facilities will have no effect on the structures and the qualities that give significance to this historic property. Files will be maintained including mapping and photographs showing the setting of each of these facilities before and after the construction.

4.7.2 No Action

Under the Quadrant II no action alternative, these facilities would eventually be abandoned and gradually deteriorate due to a lack of use and maintenance.

4.8 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

4.8.1 Proposed Action

The potential socioeconomic impacts of the proposed corrective measures activities for PORTS including demographics, employment, income, housing, public services, local government expenditures, and fiscal characteristics would be minimal. Some small and temporary increase in employment may be experienced as a result of the construction activities. No environmental justice impacts would be expected to occur from this proposed action due to the minimal impact of the proposed action off-site and the fact that there are no nearby populations of minorities which might be effected.

4.8.2 No Action

No socioeconomic or Environmental Justice impacts are associated with the Quadrant II no action alternative.

4.9 INFRASTRUCTURE AND SUPPORT SERVICES

4.9.1 Transportation

4.9.1.1 Proposed action

Under this proposed action, construction activities would result in a temporary increase in truck traffic. The number of vehicle trips to and from the site would probably be slightly greater than the current levels during the construction activities at the X-701B Holding Pond and Retention Basins area and the X-701B groundwater plume area. Impacts to transportation in the area would not require modification of roads or other infrastructure to accommodate additional traffic. The potential to ship waste to an off-site treatment, storage and disposal facility would produce a slight increase in the risk of a traffic related accident during transport. Due to the fact that this type of shipment is routinely performed at the site as a result of current operations, the increase in risk should be minimal. Shipment of these wastes would comply with all Department of Transportation (DOT) requirements including the use of DOT approved containers for shipment to minimize the risk of spills in the event of a transportation accident. Existing site processes and procedures, which are currently in place at the site to ship this type of waste to off-site treatment, storage and disposal facilities would be incorporated for the planning and execution of these shipments if required as part of corrective measures implementation.

4.9.1.2 No action

No transportation impacts are associated with the Quadrant II no action alternative.

4.9.2 Utilities

4.9.2.1 Proposed action

The potential utility impacts of the proposed action would be minimal.

4.9.2.2 No action

No utilities impacts are associated with the no action alternative.

4.10 NOISE

4.10.1 Proposed Action

The construction activities that would be required to implement the proposed action would result in minor, temporary increases in noise levels at the site. Noise would return to current levels after completion of construction activities.

4.10.2 No Action

No additional noise impacts are associated with the no action alternative.

4.11 HUMAN HEALTH AND SAFETY

No unique occupational health and safety hazards would be posed by any of the alternatives considered, including the proposed action. Falls, spills, vehicle accidents, confined-space incidents, and

injuries from tool and machinery operation could occur. Similar hazards also would be present during construction activities. Heating of soil using electrodes during steam stripping corrective measures, if utilized, would require setting up of engineered barriers to prevent worker exposure to high voltages. Workers would be expected to receive applicable training, be protected through appropriate controls and oversight, and follow standard industrial and protective engineering practices, including the use of personal protective clothing and equipment as specified in the applicable Occupational Safety and Health Act of 1970 (OSHA) regulations (e.g., 29 *CFR* 1910 and 29 *CFR* 1926).

On-site occupational radiological exposures for subcontractors implementing any modifications discussed in this EA would be similar to the doses estimated for on-site workers and would be kept below the 5000 mrem/yr limit for occupational exposure of radiation workers set by the Nuclear Regulatory Commission (NRC) and DOE. However, DOE has established an administrative control limit of 2000 mrem/yr. BJC has adopted DOE's administrative control limit guidance as their policy. To further reduce exposures, each BJC project establishes an even lower administrative control level. PORTS follows the principles of As Low As Reasonably Achievable to further limit doses to the workers as much as possible. No unique chemical exposures would be anticipated from construction activities. Potential chemical exposures for on-site workers could include various hazardous materials and chemicals such as solvents, ketones, toluene, methanol, xylenes, formaldehyde, phenols, acids, ammonia, metals, and silicates. All activities involving chemicals would be expected to comply with applicable OSHA regulations including environmental exposure standards, applicable training requirements, hazard communication programs, engineering controls, and the use of personal protective clothing and equipment. DOE has taken responsibility for the health and safety oversight on federal property with radiological restrictions.

Activities at PORTS conducted by DOE that could impact the public are subject to DOE Orders 5400.1, *General Environmental Protection*, and 5400.5, *Radiation Protection of the Public and the Environment*. Current chemical and radiological exposures would likely continue at low levels as they currently exist.

Occupational exposures for DOE and contractor workers follow the requirements of DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*, and 10 *CFR* 835, *Occupational Radiation Protection*. The NRC performs regulatory oversight of USEC activities. OSHA regulates USEC occupational safety and worker health, and the Ohio EPA and the U.S. EPA regulate USEC environmental activities.

4.11.1 Proposed Action

No additional health and safety impacts beyond those typically encountered as part of current ongoing operations at PORTS are expected with the proposed action.

4.11.2 No Action

Additional health and safety impacts may be experienced with no action alternative as a result of long-term increased migration of contaminants from the X-701B Holding Pond and Retention Basins and the X-701B groundwater plume resulting from the loss of containment and a longer residual contamination period.

4.12 ACCIDENTS

Under any of the alternatives evaluated, accidents could occur during construction activities or operation of a new or existing facility. Accidents could result from operator error, equipment malfunction, or from natural phenomena (e.g., earthquakes, tornadoes, flooding, fire, etc.). Typical accidents that could result from construction activities include falls, chemical spills, vehicle accidents, confined-space incidents, and injuries from tool and machinery operation. Potential hazards from the operation of facilities could include radiation sources, toxic/corrosive/reactive materials, flammable materials, and electrical energy. Other hazards include kinetic energy and stored energy. Examples of kinetic energy hazards include moving ventilation system components, forklifts, and other drum- or box-handling equipment. Stored energy hazards include elevated structures and equipment, stacked drums, and boxes. Consequences of these hazards could potentially include: internal and external radiation exposure to on-site and off-site personnel; exposure of on-site and off-site personnel to toxic chemicals; building fire resulting in the release of toxic and radioactive materials and the production of toxic gases, smoke, and/or corrosive materials; electrical burns, shock, and electrocution; and bruises, broken bones, cuts, etc.

An example of a typical accident that could potentially occur during the operation of an existing or new facility would be a building fire. The consequences of a potential fire would depend on several factors, including building construction materials and design and the types and quantities of materials used and stored within the building. Although most fires start as small, localized fires, the amounts of flammable materials and combustibles available in the facility could make a fire grow in intensity. There is the potential that a fire could spread and involve a major portion of the building, but with the proper mitigation measures in place, it is most likely that the fire would remain localized, affecting only the area where the fire was initiated.

A toxic material release could potentially occur inside a building as the result of a fire or explosion. Although the majority of the toxic material release concerns would be localized, the potential would exist for toxic gases or aerosols to be drawn into the building ventilation system and be distributed throughout other sections of the building. If the event were large enough, these gases or aerosols could be released to the outside.

The potential for fires and any resulting adverse impacts would likely be mitigated by the following: building modification materials would comply with all applicable National Fire Protection Association codes and standards; buildings would be equipped with fire detection systems and fire suppression equipment as applicable (e.g., fire alarms, portable fire extinguishers, and sprinkler systems); and appropriate fire safety and emergency policies and procedures, including proper training, would be implemented. Emergency response would be provided by the on-site Fire Services and through mutual-aid agreements with the surrounding fire departments and emergency response organizations.

Accidental spills of hazardous materials during construction activities or facility operations could cause contamination of localized areas of soil and subsequent impacts on surface waters and groundwater. Terrestrial and aquatic plants and animals in the affected areas could also be adversely impacted. Accidental releases of high concentration and/or large quantities of hazardous materials could cause water quality standards to be exceeded and result in fish kills. Impacts from accidental spills and releases would be addressed by individual operating entities through the use of safety procedures and spill prevention and response plans.

The Emergency Planning and Community Right-To-Know Act of 1986, also referred to as the Superfund Amendments and Reauthorization Act Title III, requires reporting of emergency planning information, hazardous chemical inventories, and releases to the environment. Section 304 of the Emergency Planning and Community Right-To-Know Act requires reporting of off-site reportable

quantity releases to state and local authorities. Accident scenarios and consequences from ongoing operations are addressed in the SAR for PORTS (LMES 1997).

4.12.1 Proposed Action

Transportation accidents under the proposed action would be expected to be similar to those that could potentially occur during normal operations at PORTS and would depend on the types and amounts of traffic entering and exiting the roads and highways in and around the site. The most common type of transportation accident that would be expected to occur would be vehicular accidents involving site workers or visitors. The increased traffic associated with construction activities such as the movement of soils to the X-701B Holding Pond and Retention Basins to construct a cap over the facilities would result in a temporary increased risk of a transportation related accident. No additional accident impacts are associated with the proposed action.

4.12.2 No Action

No additional transportation impacts are associated with the no action alternative.

4.13 WASTE MANAGEMENT AND WASTE MINIMIZATION

It is anticipated that solid waste, decontamination/groundwater solutions and construction debris would be generated as part of any of the alternatives evaluated. Waste generation, storage and handling, including any pollution prevention and waste minimization practices, would be accomplished in accordance with established procedures and regulations.

4.13.1 Proposed Action

It is anticipated that from 40,000 ft³ (selective excavation) to 2,100,000 ft³ (complete excavation) of waste material may be generated in the excavation of contaminated soil scenario and 83,000 ft³ in the construction of a cap over the X-701B Holding Pond and Retention Basins. Minor amounts (96 ft³) of construction debris and personal protective equipment (PPE) would also be generated. This material would be contaminated with both low level radioactive (LLW) and RCRA regulated constituents and would be disposed of in an appropriate treatment, storage, or disposal facility licensed to handle this type of waste. Approximately 275 gal of decontamination solutions and/or groundwater would also be generated from this action. These liquids would be treated on-site at existing treatment facilities.

Approximately 276 ft³ of contaminated soils may be generated during the implementation of the corrective measures efforts for the X-701B groundwater plume. In addition, approximately 37 ft³ of PPE and 275 gal of decontamination solutions and/or groundwater may be generated. The solid waste would be disposed of at an appropriate treatment, storage, or disposal facility licensed to handle this type of waste and the liquid would be treated on-site at existing treatment facilities.

The X-622T Groundwater Treatment Facility demolition and replacement may generate approximately 15 ft³ of contaminated soil from the installation of an additional extraction well along with 15 ft³ of PPE and 55 gal. of decontamination solutions. Demolition of existing equipment will generate approximately 1728 ft³ of scrap metal (classified as LLW) in the form of two Frac Tanks with wheels (6 ft x 11 ft x 40 ft), two carbon tanks (8 ft diameter x 10 ft high), an air stripper (5 ft x 5 ft x 6.5 ft) and piping. Approximately 480 ft³ of waste carbon (classified as LLW/RCRA) would also be generated from this activity. The solid waste would be disposed of at an appropriate treatment, storage, or disposal

facility licensed to handle this type of waste and the liquid would be treated on-site at existing treatment facilities.

The X-624 Groundwater Treatment Facility replacement may generate approximately 544 ft³ of contaminated soil from the installation of twelve new injection wells and one additional extraction well along with 30 ft³ of PPE and 660 gal. of decontamination solutions. Demolition of existing equipment would generate approximately 1728 ft³ of scrap metal (classified as LLW) in the form of two Frac Tanks with wheels (6 ft x 11 ft x 40 ft), two carbon tanks (8 ft diameter x 10 ft high), an air stripper (5 ft x 5 ft x 6.5 ft) and piping. Approximately 480 ft³ of waste carbon (classified as LLW/RCRA) would also be generated from this activity. The solid waste would be disposed of at an appropriate treatment, storage, or disposal facility licensed to handle this type of waste and the liquid would be treated on-site at existing treatment facilities.

The potential relocation/demolition of the X-747G Precious Metal Scrap Yard would require the removal and/or disposal of the LLW material currently being managed in and adjacent to the yard as well as some nearby equipment, structures and power poles. The gravel base on which the material sits would also be removed and disposed of as necessary to provide final grade to the area. The estimated volume of LLW material to be disposed of out of the yard area is 24,000 to 30,000 ft³. Any material that could not be disposed directly from the X-747G yard would be relocated and staged until disposal can be arranged. Once the LLW material is removed from the yard, the demolition of the remaining structures would generate only minor amounts of waste primarily from non-recyclable fencing material and construction debris. Characterization, handling, and disposal of all material and waste generated as a result of the relocation/demolition of the X-747G yard would be handled in accordance with existing plant procedures, guidelines, permits, Executive Orders, and all applicable Federal and State requirements.

4.13.2 No Action

The no action alternative would allow the continued generation of waste from the X-622T and X-624 for as long as they are able to continue to operate. This amounts to approximately 960 ft³ waste carbon filtration media per year (generally classified as LLW/RCRA waste). This waste would be disposed of using current procedures and facilities.

4.14 CUMULATIVE IMPACTS

Cumulative impacts are those that may result from the incremental impacts of an action considered additively with the impacts of other past, present, and reasonably foreseeable future actions. Cumulative impacts are considered regardless of the agency or person undertaking the other actions (40 *CFR* 1508.7, CEQ 1997) and can result from the combined or synergistic effects of individually minor actions over a period of time. This section describes past and present actions, as well as reasonably foreseeable future actions, that are considered pertinent to the analysis of cumulative impacts for the proposed action. These actions either have or will receive independent NEPA reviews. Future actions, although specific scope of these actions may not be accurately defined at this time, are considered for their potential to have cumulative effects in the foreseeable future.

The DOE-PORTS Environmental Restoration Program was developed in 1989 to find, analyze, and correct site contamination problems. Remedial actions taken at this site have resulted in improvement to conditions that resulted from past operations and management practices. Remedial actions may be accomplished by removing, stabilizing, or treating hazardous wastes. As of December 31, 1998, certification of closure had been received from Ohio EPA for 14 RCRA facilities:

- X-744G(U) Container Storage Facility
- X-735 Landfill (cells 1 through 6)
- X-616 Surface Impoundments
- X-705A Incinerator
- X-749 Landfill (northern portion)
- X-750 Waste Oil Tank
- X-752 Container Storage Facility
- X-700 Tank 6 Generator closure
- X-700 Chromic Acid Tank 7
- X-700 Tank 8 Generator closure
- X-744G(R) Container Storage Facility
- X-344A Settling Tank
- X-740A Waste Oil Facility and Tank
- X-326 Trap Material Storage Area (DMSA #7)

The Ohio EPA has designated five RCRA units at PORTS as “integrated units.” They include:

- X-231B Southwest Oil Biodegradation Plot
- X-744Y Waste Storage Yard
- X-701B Surface Impoundments (East Retention Basis, West Retention Basin, and Holding Pond)
- X-701C Neutralization Pit
- X-230J7 East Holding Pond

Preliminary remedial action at these sites has been completed as required by closure plans and as directed by the Ohio EPA.

Several other solid waste units have also undergone closure or corrective measures implementation including the following:

- X-735 Industrial Solid Waste Landfill (closure)
- X-749 South Contaminated Landfill (closure)
- X-749A Classified Landfill (closure)
- X-231A Oil Biodegradation Plot (closure)
- X-749B Peter Kiewit Landfill (closure)
- X-734 Landfill (closure)
- X-734A and B Construction Spoils Landfills (closure)
- X-611A Sludge Lagoon (conversion to prairie)
- X-740 Waste Oil Storage Facility Area (phytoremediation)

These actions have resulted in improvements in the overall quality of the environment at PORTS by removing sources of environmental contamination and/or providing engineered barriers to prevent or slow the migration of potential environmental contaminants from these units. In addition, improvements have been made in the understanding of the extent and dynamics of the environmental contaminants through numerous investigations and studies that have been completed. Technology demonstrations completed to date have yielded valuable information leading to the selection of effective and cost efficient corrective measures technologies.

The DOE-PORTS Technology Applications Program was established in 1993 to facilitate the introduction of innovative or experimental environmental technology into the DOE-PORTS

Environmental Restoration Program. The primary function of the technology program is to identify, evaluate, and test/demonstrate innovative advancements in environmental characterization and cleanup. Projects include:

- X-231A soil fracturing demonstrations
- X-231B in situ soil mixing with TEVE
- X-625 passive groundwater treatment through reactive media
- X-749/X-120 VER wells
- X-701B in situ chemical oxidation and recirculation
- X-701B oxidant injection using the horizontal well
- X-701B oxidant injection using lance permeation
- X-701B VER using the five-spot configuration
- 5-Unit Area (Quadrant I groundwater investigative area) oxidant injection
- X-701B underground steam stripping and hydrous pyrolysis/oxidation
- Oxidant Injection utilizing dilute hydrogen peroxide at the X-701B Groundwater Plume Area

An additional technology demonstrations planned for the near future is the In-situ Anaerobic Reactive Zone Treatment technology demonstration at the X-749 Groundwater Plume Area.

Current environmental management activities include continued sampling and investigation activities aimed at finding and monitoring areas of past environmental contamination, obtaining certification for the completed cap on the X-734 Landfill, the certification of the remediation/closure of the X-701A Lime House and X-701C Neutralization Pit, the ongoing cleanup of the X-747H Scrap Metal Yard, and the upgrade in capacity/efficiency of the X-622 Groundwater Treatment Facility. In addition to the X-622 facility, four other groundwater treatment facilities have been constructed and are operational.

Another component of the environmental management program is waste management. The DOE-PORTS Waste Management Program directs the safe storage, treatment, and disposal of waste generated by past and present operations and from current Environmental Restoration projects. During 2000, approximately 8 million pounds of waste from PORTS were recycled, treated, or disposed. DOE-PORTS also stores USEC-generated hazardous waste in the RCRA Part B permitted storage areas.

Other planned environmental management activities include:

- complete corrective measures for Quadrants I and II
- disposal of 11,764 PCB/low-level waste containers in process buildings and outside storage areas, and
- disposal of 3877 containers of RCRA low-level waste

Long-term environmental management milestones include:

- by the end of 2003, assessments and agency-required remedial actions completed (not including those actions which must follow D&D)
- by the end of 2006, all DOE-PORTS environmental management waste shipped for final disposition; and

- beyond 2006, all D&D deferred corrective measures implemented, continued operations of active and passive groundwater treatment systems, site-wide groundwater protection program ongoing, and long-term surveillance and maintenance of remedial action and D&D facilities

4.14.1 Proposed DOE Program to Secure Supply of Enriched Uranium

On October 6, 2000, Energy Secretary Bill Richardson announced a plan to further protect U.S. energy security by placing the GDP at PORTS in cold standby.

On March 1, 2001, Energy Secretary Spencer Abraham announced that DOE would provide \$125.7 million for winterizing, cold standby, and worker transition programs related to the ongoing transition at PORTS. In general, the \$125.7 million was to be broken down over two years; \$59.2 million for FY 2001 and \$66.5 million for FY 2002. The money was to support placing the facility in cold standby mode, winterizing steps to protect the facility, and worker transition programs for displaced workers once the facility is placed into cold standby mode. In May 2001, the GDP was officially placed in the cold standby mode.

Cold standby involved placing those portions of the GDP needed for 3 million separative work units per year production capacity in a non-operational condition and performing surveillance and maintenance activities necessary to retain the ability to resume operations after a set of restart activities are conducted. Feed and withdrawal systems were also placed in standby. A cadre of cascade operators, utilities operators, and maintenance staff were retained and form the basis for future restart, operations, and maintenance. The power load was decreased to about 15 Megawatts (MW). Specific steps that went into placing the plant in cold standby included:

- removing uranium deposits in certain portions of the cascades
- buffering of process cells with dry air to prevent wet air in-leakage
- installing cell buffer alarms to assure that proper integrity of the system is maintained
- revising operating and maintenance procedures

4.14.2 Depleted UF₆ Conversion Facility

In April 1999, DOE issued a *Final Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride* (DOE/EIS-0269) that described the preferred alternative for managing depleted UF₆. The Record of Decision (ROD) was issued in August 1999.

DOE has proposed to design, construct, and operate conversion facilities at PORTS and the PGDP in Kentucky. These facilities would convert DOE's inventory of depleted UF₆ now located at PORTS, PGDP, and the East Tennessee Technology Park in Oak Ridge, Tennessee, to triuranium octaoxide, uranium dioxide, uranium tetrafluoride, uranium metal, or some other stable chemical form acceptable for transportation, beneficial use/reuse, and/or disposal. A related objective is to provide cylinder surveillance and maintenance of the DOE inventory of depleted UF₆, low-enrichment UF₆, natural assay UF₆, and empty and heel cylinders in a safe and environmentally acceptable manner. A contract for the Depleted UF₆ Conversion Project was awarded to Uranium Disposition Services on August 28, 2002.

Although no site has been selected until a separate NEPA review has been conducted and a ROD has been issued, the candidate site for the conversion facility at PORTS is the lithium warehouse area. This is

an area surrounding and including warehouses X-744S, -T, and -U. The candidate site, in general, is bounded on the west side by an unnamed road west of X-744T; on the north and east side by a truck access road; and on the east and south side by a dirt construction road. Excluded from this area are buildings X-616, X-106B, and X-106C.

The proposed action would have no impact on the conversion facility. The proposed locations being considered for the facility are located on the far southern, west and northwest portions of the site. The pipeline route chosen would avoid the cylinder lots and potential sites for the proposed conversion facility.

4.14.3 Reindustrialization Program

Several ongoing initiatives are underway at PORTS in coordination with SODI, the recognized community reuse organization for PORTS. DOE's Office of Worker and Community Transition established community reuse organizations to minimize the negative effects of workforce restructuring at DOE facilities that have played an historic role in the nation's defense. These organizations provide assistance to the neighboring communities negatively affected by changes at these sites.

SODI was established in August 1995 and was incorporated as a non-profit organization in July 1997. The purpose of the organization is to create job opportunities within the four counties most affected by PORTS downsizing—Pike, Ross, Jackson, and Scioto. SODI members represent business, industry, education, economic development, government, DOE, BJC, and USEC. A Community Transition Plan was completed in 1997 and contains a series of initiatives designed to create the human and physical infrastructure necessary to decrease dependency on the DOE facility, diversify the economy, create high-wage jobs, strengthen the tax base, and improve the quality of life in the area.

DOE has provided \$10 million dollars through grants to SODI for economic development projects and has committed an additional \$2.95 million for Fiscal Year (FY) 2000–2001. SODI has invested this money primarily in the development of industrial parks in each of the four counties. In addition, SODI actively promotes the reuse of DOE property by private industry. The first lease between DOE and SODI was signed on April 1, 1998, for 2.4 to 3.2 ha (6 to 8 acres) of land on the north side of the PORTS property. The tract was used as a right-of-way (ROW) for a railroad spur to connect with the existing DOE north rail spur. A portion of this property was then subleased by SODI to the Mead Corporation for access to the rail line for a new wood grading operation. This action was covered under a NEPA Categorical Exclusion (CX) No. CX-POR-522 completed in 1997. A second lease between DOE and SODI was signed on October 13, 2000, for 4.9 ha (12 acres) of land adjacent to the area of the first lease. This tract will be used for additional railroad spurs and use of existing rail facilities. This action was covered under CX-PORTS-538.

Additional DOE real estate outgrants that have recently occurred at PORTS include the following:

- ROW easement for a waterline and sewer line,
- license for non-federal use of property for concurrent road usage,
- recreational license to Scioto Township for development of a community park,
- greenway licenses to Scioto Township and Seal Township, and
- lease/license (short-term) for use of parking lots by SODI.

Negotiations were initiated between DOE and SODI to transfer approximately 390 acres of land in the northeast corner of the site. This property, if transferred to SODI, would be subleased for the potential entities as part of a commercial/light industrial park. Negotiations regarding the transfer of this property are currently on hold.

4.14.4 Other Regional Industrial Developments

There are several industrial parks in the area that, if successful, may increase employment in the ROI (Table 4.1). Most of these parks are relatively new, and their potential for new job creation is unknown. The cumulative impact would depend on the total number of jobs created throughout the region and on the type of wages paid by the industries that located there. If all of these parks developed rapidly within the next 10 years, there could be a large cumulative impact on employment and income. However, such an impact is not likely to have any effect on or be effected by the proposed action.

Table 4.1. Additional industrial parks in the PORTS ROI

County	Site name	No. of acres
Jackson	Jackson Area Industrial Park	200
	Gettles Site	75
Pike	Zahn's Corner	376
	Scioto Township Industrial Park	200
Ross	Gateway	90
Scioto	New Boston	70
	Haverhill	1065
	522 Site	172

Source: Chandler 2000, Justice 2000, and ODOD 1999–2000.

4.14.5 Impacts

Potential cumulative impacts that could occur from the proposed action to implement Quadrant II corrective measures and the other actions described previously are presented in the following sections.

4.14.5.1 Land and facility use

Impacts from the other actions described in the previous sections have the potential to affect land and facility use at PORTS. However, the Quadrant II area affected by the proposed action is not in consideration for further industrial development in the short-term. Completion of corrective measures covered by this EA may in the long-term make portions of the X-701B Groundwater Plume area suitable for consideration as a site for future industrial activities.

4.14.5.2 Air quality

The proposed action would have minimal impacts on local or regional air quality. The existing air quality of the region is considered to be good and is in attainment for all of the NAAQS. Air emissions from the other actions described previously would only be expected to have minor impacts and not violate any of the NAAQS. Fugitive dust emissions from construction activities would be temporary and controlled by mitigation measures (e.g., watering and covering exposed soil piles).

4.14.5.3 Soil and water resources

Construction-related disturbance of natural soils would occur under the proposed action. These types of impacts would be temporary and mitigated through the use of BMPs. Accidental spills and releases of hazardous materials could also potentially impact soils. Impacts to surface water and groundwater resources could also occur during construction activities, but they also would be mitigated. None of the

actions discussed previously would be expected to have major discharges of industrial effluents that could adversely impact water resources.

4.14.5.4 Ecological resources

Construction activities associated with the proposed action could result in minor, temporary disturbance to existing habitats and biota. However, no federal- or state-listed threatened and endangered species are known to exist in the area of the proposed action. Emissions and effluents from construction and operation of the facilities to be built as part of the proposed action should not be of sufficient quantity to have major adverse impacts (e.g., stress, impairment, injury, or mortality) on existing habitats and biota. Accidental releases from ongoing and proposed operations could impact ecological resources if adequate mitigation measures were not in place and implemented.

4.14.5.5 Socioeconomics and environmental justice

No cumulative socioeconomic impacts are expected to occur from the proposed action.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, requires agencies to identify and address disproportionately high and adverse human health or environmental effects their activities may have on minority and low-income populations. As discussed in Sect. 3.8, only one census tract (9937) in the ROI includes a minority population, and this population is located several miles south of PORTS in the city of Portsmouth. Therefore, there would be no disproportionate impact on minority populations. Many of the tracts in the ROI meet the definition of low-income populations, especially the tracts nearest the site in Pike County. However, no disproportionately high and adverse human health or environmental impacts to these low-income populations are expected to result from the implementation of the proposed action. No cumulative environmental justice impacts would be expected to occur from the proposed action. Environmental justice and census tract data for the PORTS region are presented in Sect. 3.8.

4.14.5.6 Infrastructure and support services

No cumulative transportation impacts are expected from the proposed action. Implementation of the proposed action discussed previously would not require any major upgrades to existing transportation systems or major new construction of roads or rail facilities. A small increase in truck traffic could be expected during construction activities. A temporary increase in trucks on U.S. Route 23 and/or U.S. Route 32 would occur particularly during the capping of the X-701B Holding Pond and Retention Basins. Impacts to transportation in the area would not require modification of roads or other infrastructures to accommodate additional traffic.

Associated with increases in traffic is the potential for an increased number of accidents, additional noise and air pollution, and road deterioration and damage. The increase in average daily traffic volumes could result in inconveniences for other vehicles (personal and commercial) on affected routes and connecting roads. Increased pavement deterioration and damage could increase costs associated with maintaining or resurfacing roads and highways. Although noise associated with increases in traffic is normally not harmful to hearing, increased traffic noise is considered by the public to be a nuisance. Increased accidents put an additional strain on local emergency response personnel. Increased vehicular traffic also has the greatest potential to increase air pollution in the local area because emissions from motor vehicles are poorly regulated.

4.14.5.7 Human health and accidents

Cumulative public and occupational health impacts would be expected to be equal to or less than those that currently exist in and around PORTS.